

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

February 12, 2018

Global Positioning System (GPS)

Specialist's Factual Report By Sean Payne

1. EVENT SUMMARY

Location: Pineville, Louisiana
Date: November 10, 2017
Aircraft: Temco GC-1B
Registration: N2363B
Operator: Private
NTSB Number: CEN18FA030

2. DETAILS OF INVESTIGATION

The National Transportation Safety Board (NTSB) Vehicle Recorder Division received the following device:

Device Manufacturer/Model:	Garmin GPSMAP 696
Serial Number:	1H6002374

2.1. Device Description

The Garmin GPSMAP 696 is a battery-powered portable multi-function display and GPS receiver with a 7-inch diagonal high resolution LCD display screen. The unit includes a built-in Jeppesen database and is capable of receiving XM satellite radio for flight information including NEXTRAD radar, lightning, METARs, TAFs, and TFRs. The unit can also perform and store weight and balance calculations. A built-in AOPA Airport Directory and Safe Taxi Airport Diagrams are included for selected fields. The unit stores date, route-of-flight, and flight-time information for up to 50 flights. A flight record is triggered when groundspeed exceeds 30 knots and altitude exceeds 250 feet, and ends when groundspeed drops below 30 knots for 10 minutes or more. A detailed track log – including latitude, longitude, date, time, and GPS altitude information for an unspecified number of points – is stored within the unit whenever the receiver has a lock on the GPS navigation signal. Position is updated within the track log as a function of time or distance moved, depending on how the unit has been configured. Once the current track log memory becomes full, new information either overwrites the oldest information or recording stops, depending on how the unit is configured. The current track log can be saved to long-term memory and 15 saved track logs can be maintained in addition to the current track log. Track log storage may be activated or de-activated at user

discretion. All recorded data is stored in non-volatile¹ memory. The unit contains hardware and software permitting the download of recorded waypoint, route, and track log information to a PC via a built-in USB port. An internal button-battery is used to back-up power to the internal memory and real-time clock during those periods when main power is removed.

2.2. Device Condition

Upon arrival at the Vehicle Recorder Laboratory, an examination revealed the unit had sustained damage. The extent of the damage is shown in figure 1. The extraction of the data was performed by removing the unit's main board and applying power. A USB device was then connected to the unit and the data was downloaded normally, using the manufacturer's supplied software.



Figure 1. Photo of damaged unit

2.3. Data Description

The data extracted included information from December 8, 2011² through August 26, 2012. The event occurred on November 10, 2017. There were no data pertinent to the event recorded on the device. The memory chip from the device's internal NVM was imaged. The internal NVM revealed no differences in the device's tracklogs.

It is possible that data logging was turned off by the user in 2012, but the track logging setting could not be verified since the device's screen was destroyed.

¹ Non-volatile memory is semiconductor memory that does not require external power for data retention.

² All dates and times are referenced to Coordinated Universal Time (UTC).